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**White et al.**

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(54) **PATIENT-MODIFIED IMPLANT**

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(58) **Field of Classification Search**

None

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,480,285 A 1/1924 Moore  
2,181,746 A 11/1939 Siebrandt  
(Continued)

FOREIGN PATENT DOCUMENTS

CA 2447694 A1 12/2002  
CA 2501041 A1 4/2004  
(Continued)

OTHER PUBLICATIONS

"Amazing Precision. Beautiful Results. The next evolution of MAKOpasty® is here," brochure. (Feb. 2009) MAKO Surgical Corp. 6 pages.

(Continued)

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(57) **ABSTRACT**

An orthopedic implant includes a first portion including at least one feature modified to be patient-specific and match the anatomy of a specific patient from a three-dimensional digital image of a patient's joint using computer modeling. The orthopedic implant includes a non-custom inner bone-engaging surface including a plurality of planar surfaces configured for engagement with non-custom bone cuts.

**16 Claims, 4 Drawing Sheets**

